Wisconsin Highway Research Program
Request for Proposal for

Development and Implementation of the Next Generation Bridge Management System
for Wisconsin

Questions regarding the content of this RFP are due no later than
5PM (CDT), Monday, December 5, 2011

Responses to questions will be posted to the WisDOT Research and Library website
(http://wisdotresearch.wi.gov/rfps-and-proposals) by Monday, December 12, 2011

Proposals are due
5 PM (CST), Friday, January 13, 2012

For further information regarding this RFP
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Monday, November 21, 2011

Researcher Proposal Preparation Guidelines

WHRP Proposal Guidelines are available on the WisDOT Research and Library website (http://wisdotresearch.wi.gov/wp-content/uploads/WisDOT-Policy-Research-proposal-guidelines-master.pdf). Please refer to these instructions in preparation of your response.

I. **Background and Problem Statement**

The Wisconsin Department of Transportation (WisDOT) is faced with a significant challenge in addressing the preservation, repair, and replacement needs of the bridges in the State. Currently, more than 14% of WisDOT's structures are classified as either structurally deficient or functionally obsolete with many more structures in jeopardy of a similar classification if appropriate rehabilitation work is not prescribed. This deficiency issue is also exacerbated by increasing travel demands, limited funding, and increasing costs of labor and materials.

Thus, WisDOT is seeking to develop cost effective strategies and actions to maximize the useful life of its bridges. Applying the appropriate bridge preservation treatments and repair/replacement activities at the appropriate time can extend a bridge's useful life at a lower lifetime cost.

WisDOT is interested in using the next generation of bridge management systems (BMS) being developed by AASHTOWare (PONTIS 5.2 or greater). For it to be an effective tool, the BMS requires up-to-date state-specific information related to costs and deterioration. This research will focus on the collection and derivation of data needed by this next generation system as well as on the implementation of the BMS for WisDOT.

II. **Objectives**

The objective of this research is to collect and derive Wisconsin specific data for implementation of the next generation BMS and to test the effectiveness and accuracy of this data by testing a subset of WisDOT bridges in the BMS.

III. **Scope of Work**

Research shall include, but not be limited to, the following tasks:

Phase I: Bridge Management System Development
Task 1: Literature Review
Collect, review, and interpret relevant practice, performance data, research findings, and other information related to this research statement.

Task 2: Database Development
Study and develop a protocol for migrating existing element data from the Highway Structures Information System (HSI) into the new elements as specified in AASHTO Guide Manual for Bridge Element Inspection – First Edition 2011. Test these protocols on a subset of bridges in HSI. Determine if the existing HSI data structure is sufficient or if changes to HSI need to be made to implement this migration.

Task 3: Work Plan Development and Interim Report
Submit an interim report detailing the findings of tasks 1 and 2 as well as a work plan for the remaining Tasks to the Project Oversight Committee (POC) for review. The work

plan will include an updated project schedule. Approval of interim report and work plan by POC must be obtained prior to continuation of study.

Phase II: Bridge Management Customization and Implementation
Task 4: State Specific Customization
Analyze and develop agency specific factors for the BMS, including but not limited to Risk Management factors, deterioration rates, unit costs, utility curves, and indirect costs.

Task 5: User Manual
Develop protocols, spreadsheets, software, etc. as necessary for long-term updates to the user specific data collected in Task 4.

Task 6: Bridge Management System Pilot
Pilot and demonstrate the BMS utilizing the subset of bridges from Task 2 and the data collected in Task 4. This will include uploading the elements developed in Task 2 as well as uploading relevant information from the HSI database to perform modeling and optimization.

Task 7: Implementation Plan
Develop an implementation plan for WisDOT to migrate to the BMS, including element migration, user-specific data updates, etc.

Task 8: Project Deliverables
- **Draft Final Report:** Submit a draft final report three (3) months prior to end of contract for Technical Oversight Committee (TOC) review. The report shall include research results and proposed revisions to appropriate special provisions and structural details. Recommended revisions to the WisDOT Bridge Manual shall also be included in the Appendix.
- **Project Closeout Presentation:** The researcher is required to present the findings of the research including an assessment of implementation potential to the WHRP Structures Technical Oversight Committee (TOC).
- **Final Report:** Revise draft final report based on TOC comments and submit final report to WHRP. One electronic copy and 15 hard copies of the report are required.

IV.   <u>WisDOT/TOC Contribution</u>

a) Expected Contribution of TOC/WisDOT Staff:
   i) WisDOT will provide staff to monitor project progress, review the interim report, and review/approve the draft final report. The researcher is responsible for scheduling periodic meetings with the Project Oversight Committee (POC) to support timely completion of project tasks.
b) WisDOT Equipment
   i) Researchers should not assume availability of WisDOT equipment in the proposal. If equipment is donated to the project by WisDOT or another entity, a letter of commitment must be included in the proposal. It is not expected that this project will require the use of any WisDOT equipment.

V. Budget and Time Frame

a) Project Duration: The total duration of the project is 36 months, with an anticipated start date of August 1, 2012. The duration for Phase I and Phase II are provided below. The Gantt chart for both project phases are required in the proposal.
   1) Phase I: 12 months
      a) The interim report shall be submitted no later than 9 months after the project start date.
   2) Phase II: 24 months
      a) The draft final report shall be submitted no later than 3 months before the project end date.
      b) The contract is considered closed upon submission of the electronic and hard copies of the final report.
b) Project Budget: The total project budget is $175,000. The researcher is expected to provide a proposal for both Phase I and Phase II of the project. The funding for each Phase is allocated as follows:
   1) Phase I: Bridge Management System Development: $100,000.
   2) Phase II: Bridge Management System Implementation and Pilot: $75,000.
c) Award of Phase I of the project does not guarantee award of Phase II. The decision to fund Phase II will be made by the WHRP Structures TOC based on Phase I results.
d) The researcher is expected to submit the draft final report with quality technical writing and proper grammar. It is acceptable to include a technical editor on the research team to ensure these requirements are met.
e) Matching funds will not be considered in the proposal evaluation process.

VI. Implementation

The final report shall detail all aspects of the research and findings. Also, recommendations shall be developed for implementation related to both migration of HSI elements as well as recommended updates to user-specified data.

VII. Special Notes

- The HSI system currently uses elements as defined in the AASHTO Guide for Commonly Recognized Structural Elements. Part of this research will be to demonstrate the migration of these CoRE elements into the new AASHTO Guide Manual for Bridge Element Inspection elements.
- For Task 2, pay particular attention to the migration. There is an open-source migration tool developed for this purpose that can be obtained from AASHTO.
- Periodic meetings should be scheduled with the POC for completion of Tasks 2, 4, 5, and 6.
- PONTIS 5.2 or greater is the BMS system that shall be utilized in this research.